

## **Chapter 3**

### **Research Methodology**

#### **3.0 Introduction**

This chapter describes about the methodology used in gathering the empirical material for this study. The research strategies as well as the procedures adopted for this study are detailed next in Section 3.2 and Section 3.3. The limitations of the research are also briefly examined in order to place it in its proper perspective in Section 3.4. Section 3.5 will be the chapter summary.

#### **3.1 Research strategy**

It is crucial in any research that the methods adopted are appropriate to the questions being examined. The main research question of this study is how did PETRONAS develop its technological capabilities in the upstream sector? To answer this question, the case study method was used. The case study strategy was used mainly due to strict company policy regarding access to information. Such information was considered to be classified by PETRONAS as it might be leaked out to its competitors.

The study is aimed at examining the development of technological capabilities in the upstream sector of PETRONAS, as well as the methods used to acquire its capabilities. In Chapter 2, the literature review discussed the mechanisms used for acquiring and developing technological capabilities as well as using the capabilities for coming up with new innovations. This study hopes to establish whether such findings hold true in the case of PETRONAS.

A total of 4 case studies were adopted for this study. These studies were based on books, articles, journals, internet, newspaper reports, conference papers and information gleaned from professionals in the oil and gas industry. The four selected case studies from the upstream sectors were namely the MITCO (Japan) partnership, an interview report with a senior manager of PCSB, the acquisition of Engen Ltd and PETRONAS' production effort in Vietnam. Extensive, but unsuccessful, attempts were made to undertake case studies in more upstream sectors but to no avail. The reasons gave by PETRONAS was that, such detailed information would compromise their company's policy and it might benefit the competitors if they managed to get hold of it. The failure to obtain more case studies from the upstream sector does not invalidate the generalizations that can be reached from the examination of case studies.

### **3.2 Design of the study**

This study will employ the case study method to obtain information regarding the learning processes and how PETRONAS went about to acquire and develop its technological capabilities.

### **3.3 Methodology (Data Collection)**

The source for the case studies are gathered from journals, in house magazines, the internet, interviews with PETRONAS staffs and among other means such as newspapers and journals. The case study method was utilized because it provides in-depth review of technology management within the firm and allows for case examples to illustrate and clarify the assessment.

An unstructured interview was also conducted with two personnel from the management and technical side of PETRONAS Carigali Sdn. Bhd. This interview was very useful in gathering information and data, which were related to the study. Such information is very exclusive and is not readily available on current literatures regarding the upstream petroleum industry.

#### *3.3.1 Case Study Approach*

The case study method will be employed in this study. This study will focus on the upstream sector of the oil industry. Four different case studies are utilized in which they will cover different aspects of technology capability development mechanisms. The covered mechanisms are learning by working in companies possessing the technology and setting up smart partnerships. Another case study will concentrate on the technology transfer agreement recruitment of experienced/trained personnel and the last case study will concentrate on the purchasing and acquiring of a company and technology.

3.3.2 Interview

An unstructured interview was conducted with Mr. Chandra Mohan an Operations Manager and also with Dr. Deva P. Ghosh a custodian from the geophysics department, Exploration Division from PETRONAS Carigali Sdn Bhd for about 2 hours in PETRONAS' headquarters, the PETRONAS Twin Towers. Mr Chandra Mohan has been working with PETRONAS for over 24 years and has vast experience in the upstream business of PETRONAS. Dr. Deva P. Ghosh, an expatriate from the United States who is an Indian national, is an expert on deepwater production and also on 3D and 4D seismic studies. He has been attached with PETRONAS for about 5 years and his previous working experience are in the rough North Sea, Gulf of Mexico and in other prime oil development areas.

A few samples of the questions that were asked to Mr. Chandra Mohan and Dr. Deva P. Ghosh are:

1. What were the factors that contributed to the rapid accumulation of technological capabilities by PETRONAS.
2. What were these factors and how did these factors quickened this accumulation process?
3. How has PETRONAS' participation in the petroleum sector engendered the growth of the local supporting industries?

4. Are there any examples of the innovations that have been undertaken by PETRONAS in exploration to demonstrate that PETRONAS has achieved technical excellence equivalent to the best in the industry ?
5. How does PETRONAS measure to current industry standards in exploration?

The interview lasted for about 120 minutes. The interviews were not taped since it was believed this might constrain the interviewee from being completely forthright. Notes were taken during the interviews and were written up within the next day or two.

### *3.3.3 Documentation*

A major source of information for this study was obtained from PETRONAS' annual report and as well as their in house magazine obtained from the Company's resource center, which is located in the PETRONAS Twin Towers. Besides that, the book written by Paddy Bowie entitled 'A Vision Realised: The Transformation of a National Oil Corporation' also contributed much to this study. Newspaper clipping, journals<sup>71</sup>, articles, Internet and conference papers also provided valuable additional information.

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<sup>71</sup> The journals here refer to others journals and not the in-house publications

### **3.3.4 *Informal Sources***

Discussions were held with some other PETRONAS staff, particularly in the resource center of PETRONAS and in PETRONAS Research and Scientific Services Sdn Bhd which is located in Bangi, in order to obtain more information regarding this study.

## **3.4 Research Limitations**

These studies were based on books, articles, journals, newspaper reports, conference papers and information gleaned from professionals in the oil and gas industry until the date of March 31, 2002, unless stated otherwise. Besides that, in the upstream petroleum sector, it is divided into two main divisions, which is the exploration arm and the production arm. They work almost concurrently to set up an oil production system, thus limiting the scope for choosing case studies that can show the different mechanisms utilized to acquire capabilities in each division.

## **3.5 Chapter Summary**

This chapter provides an account of the methodology employed in this study. It described why a case study approach was adopted for the study as well as how information was obtained from various sources. The information obtained from these diverse sources was useful in providing a variety of perspectives on PETRONAS' upstream sector. Also, they formed an important means of corroborating as well as developing upon information

obtained through interviews. Such information was used in constructing and analyzing the case studies, which will be, examined in chapters 5 and 6. However, before analyzing the ways on how PETRONAS has managed to acquire its capabilities, an overview of PETRONAS and the evolution of the production sharing contract (PSC) in Malaysia is presented in the next chapter.